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International application No.

PCT/EP2004/009964

INTERNATIONAL PROVISIONAL REPORT ON  
PATENTABILITY (ADDITIONAL SHEET)

Regarding Point III

No provision of an expert opinion on novelty, inventive activity and commercial applicability

1 Although claims 1 and 9 have been worded as separate independent claims, they nevertheless appear actually to relate to one and the same subject. Furthermore, claim 9 not only claims the subject of the claim itself (sealing means), but also contains features which relate to the use of the subject, that is to say further subjects are also defined (two directly adjacent components with respective collars) which are not part of the first subject claimed (see PCT directives on search and preliminary examination, Section 5.37). For this reason, the intended scope of protection of claim 9 is unclear, and this therefore does not fulfil the requirements of Article 6 PCT.

Taking into account the remarks made under Point V, paragraph 4.2, the following is established: claim 9 is not clear in its present form and would therefore have to be either clarified or omitted. A claim 9 clarified in accordance with Article 6 and pursuant to the introduction given in the PCT directives, Section 5.37, would presumably have fulfilled the criteria of Article 33(2)-33(4) PCT. A claim 9 clarified in this way would, however, result in claim 1 becoming a dependent claim, since claim 1 would contain all the technical features of the clarified claim 9.

Regarding Point V

Substantiated findings as regards novelty, inventive activity and commercial applicability; documents and explanations in support of this finding

1 Reference is made to the following documents:

D1: EP-A-1118806  
D2: EP-A-1323891  
D3: US-A-5049032

**Independent claim 1**

2 Document D1 is considered to be the nearest prior art with respect to the subject of claim 1. It discloses (the references in brackets refer to this document) a gas turbine with a rotor (9) and with an inner casing (21) which consists of two rings (33, 35) lined up with one another, so as to leave an annular gap (55) between two directly adjacent rings. The two rings have in each case a collar (47, 53) in the region of the annular gap, which collars partially overlap one another, an annular sealing means (61, 63, 71) being provided for sealing off the annular gap.

2.1 The subject of claim 1 therefore differs from the known gas turbine in that the sealing means is designed as a spring element with a first end, with a second end and with a spring region lying between them, and in that the first end is secured in one of the two rings in a circumferential groove open toward the annular gap, and in that the collar arranged on the other of the two rings has, for the second end of the

spring element, an annular bearing surface against which the spring element bears, prestressed, so as to seal off the annular gap, while, in order to generate the prestress, the spring region is supported on an annular supporting surface which is provided on the collar of the one ring and which faces the annular bearing surface.

The subject of claim 1 is therefore novel (Article 33(2) PCT).

- 2.2 The object to be achieved by means of the present invention may therefore be seen in improving the sealing action of the sealing means, as compared with the known prior art.
- 2.3 The solution proposed in claim 1 of the present application for achieving this object is based on inventive activity (Article 33(3) PCT) for the following reasons:  
proceeding from D1, a person skilled in the art would not aim to solve this problem by providing the use of a separate sealing means. Paragraph 0006 of D1 clearly describes the disadvantages of using a separate sealing means and, in paragraph 0009, makes it clear that the essence of the invention is not to seal off the gap between the wall segments by means of a separate sealing element, but by means of the wall segments themselves. Although such a separate sealing means (71) is disclosed in Fig. 6, there is no motivation for a person skilled in the art to exchange the existing sealing element for a sealing element, such as disclosed in D2 or D3. Even if such an exchange were considered obvious, further modifications in the wall segments, such as the introduction of the groove into one of the two wall segments, would be necessary in such a way that a secure fastening of the sealing element and a generation of the prestress of the spring region or the annular supporting surface would be ensured. These modifications are comprehensive and are also not suggested by either of the two documents, and therefore inventive activity according to Article 33(3) PCT is inherent in the provision of such a sealing arrangement. Furthermore, the arrangements disclosed in D2 or D3 do not correspond to the configuration claimed which consists of two rings lined up with one another, so as to leave an annular gap between two directly adjacent rings, the two rings in each case having a collar in the region of the annular gap, which collars partially overlap one another. In this, a further argument is seen as to why an integration of a sealing means from D2 (or D3) into the D1 arrangement is not obvious, and that the subject of claim 1 is therefore inventive.
- 2.4 Claims 2-8 are dependent on claim 1 and consequently likewise fulfil the requirements of the PCT as regards novelty and inventive activity.
3. The invention can be applied on an industrial scale in the field of gas turbines (Article 33(4) PCT)).

#### Independent claim 9

4. Regardless of the lack of clarity mentioned under Point III, paragraph 1, the following is noted.
  - 4.1 If the sealing means and its technical features themselves (that is to say a sealing means which is designed as a spring element with a first end, with a second end and

with a spring region lying between them) are considered, then the subject of claim 9 is not novel within the meaning of Article 33(2) PCT, since such a spring element with all the technical features is disclosed in both documents D2 and D3. The requirements of Article 33(1) PCT are consequently not fulfilled.

4.2 If not only the sealing means itself, but also the further components involved in the arrangement were taken into account in order to assess novelty/inventive activity, then the same judgment as in Sections 2-2.3 of this report for claim 1 would be arrived at.

**Regarding Point VIII**

**Specific remarks on the International Application**

1 Claim 7 contains no technical features which further characterize the gas turbine, but seems rather to relate to a description of the state of the pressure conditions on both sides of the sealing means. The applicant would have to clarify this claim (Article 6 PCT), for example by the insertion of further technical features relating to the gas turbine or the sealing arrangement. Claim 7 would otherwise have to be deleted.